

4. Head viewed from behind; *a.* right temporal muscle; *b.* great pyramidal muscle.
  5. Lower jaw, side view; *a.* cavity for articulation; *b. b.* coronoid processes.
  6. Tongue seen from above; *a.* horny scoop; *b. b.* extensor muscles.
  7. Tongue, side view; *a.* horny scoop; *b.* extensor muscles; *c.* flexor muscle.
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ART. LVIII. *Remarks on some English Fishes, with Notices of three Species, new to the British Fauna.* By WILLIAM YARRELL, Esq., F.L.S., &c.

THE season for Whitebait fishing having expired soon after the sending my former remarks on that subject for insertion in the XIVth Number of the Zoological Journal, I waited with some anxiety for the period when nets of small meshes might legally be worked at the mouth of the Thames for Smelts and Sprats, in the hope of obtaining further evidence of the distinction between Whitebait and Shads; and in this expectation I was not disappointed. I obtained, but in small numbers only, both adult Whitebait in roe, and some young ones; but it appeared that the large shoals of this fish, like all those which visit the fresh water for the purpose of depositing their spawn, had, with their fry of the year, quitted the river and returned to the deep. As late as the month of November I obtained several small Shads, only  $2\frac{1}{2}$  inches in length, which illustrated another point in the history of that fish. We are told by Baron Cuvier and M. Valenciennes, in the second volume of their work on the Natural History of Fishes (p. 25) that a Perch of 7 inches is in his third year; and I therefore felt convinced that these young Shads, only  $2\frac{1}{2}$  inches in length when taken in November, were in reality young fishes of the same year, and that the young Shads of 4 inches in length, obtained in the months of July and August preceding, were the young fishes of the year before, the greater part of them having arrived at the length of 4 inches

at or very soon after the time the adult fishes had shed their ova. There was also this obvious and invariable distinction between young Shads and Whitebait: the latter never exhibited any trace of the spots on the sides so conspicuous in the Shads. The Shads, on the contrary, were never without some indication of these peculiar spots, though their number and intensity of colour appeared to depend on the strength and condition of the fish. The first spot immediately behind the operculum however is never wanting; some of the young Shads taken in July and August exhibited as many as five spots, of which the specimen figured was an example, but the youngest as well as the weakest invariably possess one spot behind the upper part of the edge of the operculum; even the young Shads of  $2\frac{1}{2}$  inches only, taken in November, the smallest I have been able to procure, have this distinction, and in this state most resemble Whitebait; but I may add in conclusion, as an invariable point of distinction between the two fishes, that I have never seen a Whitebait of any age or size with this spot, or a Shad without it.

On shewing a series of specimens of these two fishes to M. Valenciennes during his late visit to London, that gentleman, who has made this branch of Natural History his particular study, stated that he considered them decidedly different.

In proposing the term *alba* as a specific distinction for the Whitebait, in a former paper, I by no means intended to be understood as supposing that this fish had remained as yet undescribed by Continental Naturalists, I only desired to claim for this distinct species an appropriate appellation in our list of British Fishes. It may be "Le Prêtre ou Spret de Calais, le Franc-Blaquet ou Franche Blanche," four names given by Duhamel to one small species of Clupea, though his figure is not like our fish; yet as the Whitebait frequents the Thames every summer, it is not unlikely that it should be taken at Calais.

Sir Everard Home, in his recently published additional volumes on Comparative Anatomy (Vol. V. c. 4, sect. 1, page 232 and Vol. VI. plate 28) has inferred, from certain resemblances in the ova and serrated abdominal edges of four fishes of the genus Clupea, that the Whitebait is a young Shad, and the Sprat a young Herring. Dr. Fleming, in his History of British animals, published in 1828, does not allow the Sprat a place among his fishes, and at page 183, after giving the specific cha-

acters of the Pilchard (*Clupea Pilcardus*,) the following sentences occur: " The fry of the Herring and Pilchard are confounded together under the " epithet *Sprat*. The position of the dorsal fin, in reference to gravity, " furnishes, however, an obvious mark of distinction." The differences already detailed as existing in the anatomy and habits of Whitebait and Shads render any further observations on that subject unnecessary, while between the Sprat and Herring the distinctions are still more decided. On comparing a Sprat with a young Herring of the same length, at which age they are called by the fishermen Yawlings, the Sprat will be found to be considerably deeper, and the scales much larger; in this latter circumstance the Sprat resembles the Pilchard, but the Pilchard on the other hand is not so deep a fish as the Herring. The Sprat and Herring differ also in the number of rays in three of their fins out of the four they possess, and also in the tail, as the following numbers exhibit.

	D.	P.	V.	A.	C.
Sprat . . . . .	17	15	7	18	19
Herring : . . .	17	14	9	14	20

There is also one other most material difference, the vertebræ in the Sprat are 48 in number, in the Herring there are 56, as I have ascertained upon many examples of both species.

The number of vertebræ in the Whitebait and Herring being the same might suggest the idea that the Whitebait were young Herrings, but the economy of the species prevents this conclusion. The Whitebait are unknown on the shores of our various Northern Islands, where the Herrings in myriads deposit their spawn; and on the other hand, the Thames produces Whitebait in abundance during the summer, remaining with us till August, when the Herrings are heavy with roe which they do not deposit till October:

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#### SOLEA PEGUSA.

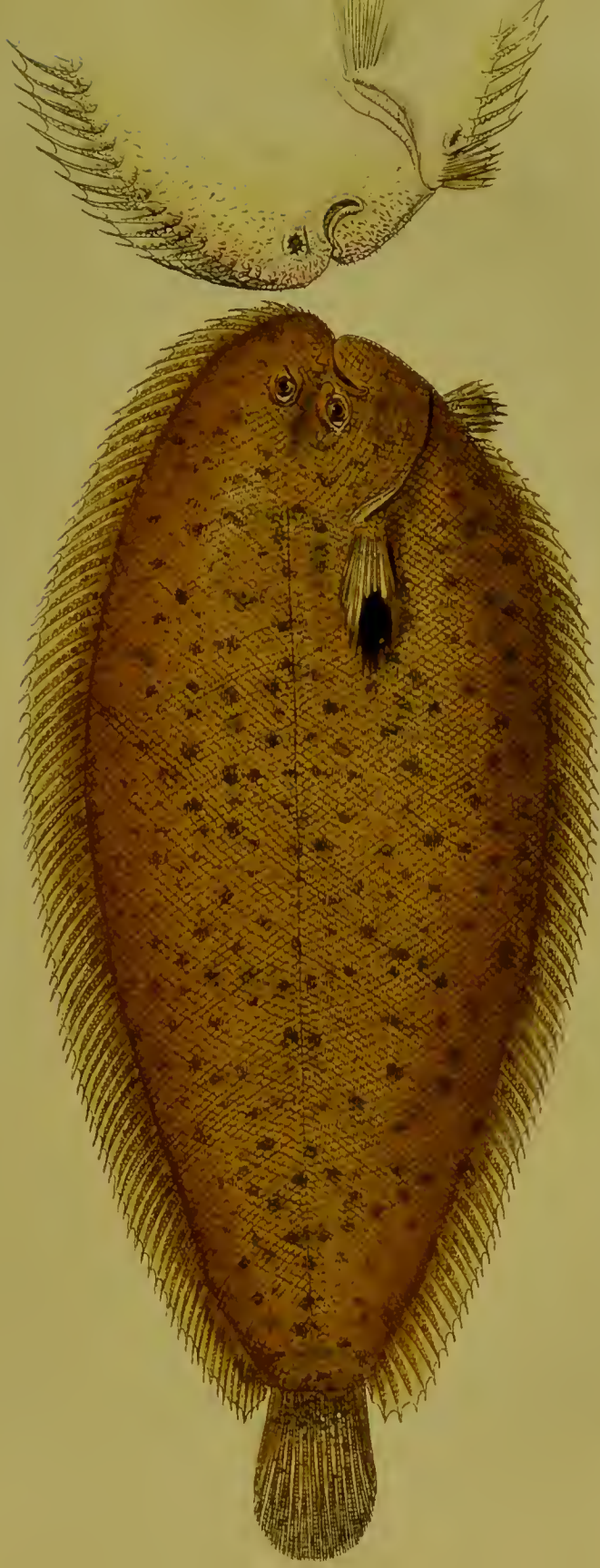
During a short visit to Brighton the last week of February I obtained a single specimen of a Sole which it occurred to me had not been admitted into any British Fauna, and further search on my

return home has confirmed that opinion. No description in our various ichthyological works appearing to agree with this species, I venture to consider it as new to our coast, and shall therefore describe it. In shape it is wider in proportion to its whole length than the common Sole (*Solea vulgaris*) and it is also somewhat thicker. The specimen measures from the point of the nose to the end of the tail 8 inches, across the widest part of the body, not including the fins, 3 inches, including both fins, 4 inches. In an example of the common Sole obtained for comparison, the whole length of which was 8 inches and  $\frac{3}{8}$ , the greatest breadth without the fins was only  $2\frac{1}{2}$  inches, with the fins included,  $3\frac{1}{2}$ . The number of rays in the different fins of the two species were

	D.	P.	V.	A.	C.	
Common Sole. . .	84	7	5	67	17	vertebræ 47
New species. . . .	81	8	5	69	17	,, 43

In its general aspect this new Sole, compared with our common species, is much more round and fleshy, the head obtuse, shorter and wider, the mouth arched, the operculum formed externally of a single piece, circular in shape and less deep, tip of the pectoral fin black, lateral line straight but not very strongly marked, tail narrower than in the common sort though composed of the same number of rays, the prevailing colours a mixture of orange and light brown, freckled over with small circular spots of very dark brown, giving a mottled appearance to the whole upper surface. The scales also differ both in character and general arrangement. On the under side the appearance is still more characteristic of its distinction. The surface of the head is almost smooth, without any of the papillary eminences so remarkable in the common sort, and the nostril is pierced in a prominent tubular projection which is wanting in the other; the under surface white, the appearance of the scales more strongly marked than upon the upper. This species is occasionally taken with the common Sole by trawling over a clear bottom of soft sand, about 16 miles from Brighton. It is but partially known there by the name of Lemon Sole, and the same name is by the fishermen also applied to a species of *Pleuronectes*, which however has no resemblance to this new fish beyond that of its prevailing yellow colour.







It appears to be perfectly distinct from the *Pleuronectes Lingula* of Pennant, which may be considered the *Pleuronectes Linguatula* and *Pleuronecte languette* of Linn., Gmel., and La Cépède, and differs also from the *Pleuronectes variegatus* of Donovan. A short description of *Solea Pegusa* will be found in the *Histoire Naturelle des Poissons* of M. La Cépède, Vol. IV. p. 639; it appears to be a fish of the Mediterranean, and according to M. Noel of Rouen has been taken in the environs of Caen, but considered very rare. It is described shortly by Risso, under the names of *Sollo de rocco*, *Pleuronecte Pegouse* and *Pleuronectes Pegusa* in his *Ichthyologie de Nice*, p. 308, and is also the *Monochirus Pegusa*, *Monochire Pegouse* and *Solla d'arga* of the same author's *Histoire Naturelle des principales productions de l'Europe Meridionale*, Tom. III. p. 258.

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The different writers on British Fishes agree in admitting but one common species of fresh-water Eel, but from recent examinations I am induced to believe there are two, independent of course of the species our markets are largely supplied with from Holland, which appears to be distinct from either. The difference between our two Eels is immediately apparent when they are brought together for comparison, by the very opposite characters of the head, the one being as remarkable for its slender and attenuated form, as the other is robust and blunt. The sharp-headed Eel, which I call it for distinction, appears to be the *Anguilla vulgaris* of authors. In this species the head is angular, depressed, eyes small, placed immediately over the angles of the mouth, irides yellow, both jaws narrow, acute, the lower jaw longest, nostrils with two openings on each side, one tubular, the other a simple pore near the eye, gill opening before and below the pectoral fin, the fin  $1\frac{1}{2}$  inch from the point of the nose, dorsal fin occupying  $\frac{3}{4}$  of the whole length of the fish, lateral line straight, tail acute. In the second species the head is rounded superiorly and flattened from the eyes forward, both jaws broad and blunt, the lower one the widest, and longer than the upper, the eyes large, placed rather before the gape, irides golden yellow, the gill openings, pectoral fins, commencement of the dorsal fin and the vent placed farther back than in the sharp-headed Eel, pectoral fins larger, tail broad,

dorsal and anal fin much deeper and thicker in substance than in the first species. The two Eels here described were of the same length. The sharp-headed fish, measured two inches in girth, and was a male, the blunt-headed species measured  $2\frac{5}{8}$  inches, and proved a female; of five others examined as to the sexual organs, two were males and three females, exhibiting distinctly their milt and ova. The figure in Bloch is that of the sharp-headed eel, that in Meyer, plate 42, is a representation of the blunt-headed Eel; both species appear therefore to be known on the continent. I have said nothing of colour in either, believing that it affords no true specific distinction, and may partly depend on the quality of the water from which they have been taken. This species may be the Grig of Pennant, but this is stated to be of small size and less fat than the sharp-headed species. This has not been the case with numbers that I have examined by comparison, which have universally appeared one-fourth larger in circumference, for equal length, and in good condition. A prejudice exists that all fishes with large heads are in bad condition or out of season, which though true in regard to Trout or Salmon, is certainly not founded in fact with respect to Eels.

#### COTTUS BUBALIS.

During the summer months of last year, when pursuing the investigation of the distinctions between the Whitebait and Shads, I was supplied with three examples of the genus *Cottus*, taken at the mouth of the Thames, which at that time, more intent on the subject I had in hand, I took no notice of beyond placing them in a preserving liquid, believing them to be specimens of *Cottus Scorpius*. When favoured lately with a visit from M. Valenciennes, and looking over a small collection of British Fishes together, that gentleman pointed out these specimens as examples of the *Cottus Bubalis*, and demonstrated the specific differences between *Bubalis* and *Scorpius*. The *Cottus Bubalis* appears to have been noticed by Euphrasen, Nouv. Mem. de Stockholm, Vol. VII, plate 4, fig. 2 and 3; it is also noticed in the *Règne Animal* of Baron Cuvier, Vol. II. page 306, note.

The *Cottus Bubalis* is distinguished by having the head still more powerfully armed than the Father Lasher, and is thus characterised by Schneider, Vol. I. p. 62. “Capite depresso, scabro, spinoso, bicorni, oculis



“ verticalibus, approximatis, linea laterali scabra, tuberculata, radiis 4  
“ pinnarum ventralium.”

This species has not hitherto been admitted in our Fauna, yet I have reason to believe it is very common, and has been constantly confounded with *C. Scorpius*. The fin rays are as follow.

	1st D.	2d D.	P.	V.	A.	C.
Cottus Scorpius .	10	14	17	3	10	12
Bubalis .	8	11	15	3 or 4	9	10

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*Atherina Hepsetus.* The Atherine is taken in great abundance during the spring months within a short distance of Brighton. A fishing-boat's crew under favourable circumstances have been known to take as many as would fill a bushel measure during one tide. They are sold under the name of Sea-smelt and Sand-smelt, from the nature of the bottom over which they are taken; but possess none of the odour, and but little of the flavour, peculiar to the true Smelt. The Atherine is plentiful along the extended line of our Southern coast, but only occasionally makes its appearance in the London Market.

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The *Sparus lineatus* of Montagu, described and figured in the Wern. Mem. Vol. II. p. 451, tab. 22, a specimen of which I exhibited a short time since to the Zoological Club, and of which I have since seen a second example, both taken on our coast, proves to be a Mediterranean fish, the *Sparus Sargus* of Bloch, but imperfectly figured. Its characters are given by Schneider, Vol. 1. p. 270. The trivial name *lineatus* proposed by Montagu, and recently adopted by Dr. Fleming, will therefore require to be changed.

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